A. Shdanow, E. v. Haerdtl, M. Wolf, M. Brendel, V. Wellman, and H. Masal.

Such was his renown on the continent, that pupils came from all countries to study under him and hear his lectures. He was one of the few who knew how to communicate to his hearers the noble passion for the science which animated him. His enthusiasm raised the expectations of his pupils, while, at the same time, their spirits were benefited by the rich ideas of their master. Gyldén was a true teacher whose noble character obtained respect, while his simple and cordial nature inspired affection.

Astronomers know that to Gyldén a great advancement of the astronomy of precision is due; his admirable series of observations with the meridian circle hold a high place of honour.

He wrote his celebrated historical representation of astronomy, which appeared later (1877) in the German language as "Die Grundlehren der Astronomie." He was also the founder and publisher of the observatory publication "Iakttagelser och undersökningar anstälda på Stockholms observatorium," which contained not only the results of the observations with the meridian circle, but theoretical investigations carried out by him and, to some extent, by his pupils.

Gyldén, is above all, known in the world of science by his works that he pursued since the death of Le Verrier, on the general theory of perturbations. In proceeding to a revision of the methods of approximation in the "mécanique celeste," he has rendered the most eminent service to this branch of science.

Having completed the main points of his investigations on the intermediate and absolute orbits of the heavenly bodies in a series of publications, "Undersökningar af theorien för himlakropparnas rörelser," I.–III., 1881-1882, he was able in 1884, by means of a grant of money from his Government, to make considerable progress in the application of his theory to the solar system. It was his intention to bring together all the results in one work entitled "Traité analytique des orbites absolues des huit planètes principales," but only the first part, containing the analytical developments of the absolute orbits, has as yet appeared. Gyldén, unlike Tisserand, did not have the satisfaction of leaving behind him a complete work.

Unfortunately he was denied the labour of completing the necessary numerical calculations. On the other hand it was a great pleasure for him to see his last great work, consisting of tables giving the coefficients, in the expressions of the perturbations, dependent on the proportion of the half-major axes, in a nearly completely printed condition. This was brought about by the generous assistance of Miss Bruce, who supplied the necessary means.

In the year 1884 he was called by the University of Göttingen to fill the post of Professor of Astronomy there; but, following the expressed wish of the Stockholm Academy of Sciences, he remained, receiving, through the generosity of the King, means to deliver lectures at the University. Since 1888 he was an active teacher of astronomy at the High School in Stockholm.

The results of Gyldén's many and varied scientific studies on stellar parallaxes, proper motion of stars, explanation of certain variable stars, application of partial anomalies, conveyance of perturbation developments, cosmical questions, &c., have appeared in a series of large and small treatises, in the *Acta der Akademie der Wissenschaften*, and the *Acta Mathematica*.

Besides being a member of several foreign Societies, he was President of the Astronomischen Gesellschaft from 1889 to 1896.

Gyldén has left behind him a widow, two sons and two daughters, besides numerous friends, scattered in different parts of the world, who lament deeply the loss of a kind friend and sympathetic fellow-worker.

NOTES.

THE final entombment of M. Pasteur is to take place on the 26th of this month, at the Pasteur Institute. The reason why so inconvenient a day for English people has been fixed is that the 27th is the anniversary of Pasteur's birth, and as that day falls on a Sunday this year, the Saturday previous was chosen as more suitable. The ceremony is to be semi-official and *semi intime*. The members of the family and a few intimate friends will attend a short religious service at Notre Dame, where Pasteur's remains have in the meantime been deposited, and members of the Institute of the Academy, the representatives of the Government, and delegates from learned societies and foreign countries will meet the cortège on its arrival at the Pasteur Institute at 9.45 a.m. It is expected that Sir Joseph Lister will represent the Royal Society, Sir John Evans the British Association, Sir William Priestley the University of Edinburgh, and Sir Dyce Duckworth the Royal College of Physicians. The mausoleum in which the remains of the great investigator will find their last resting-place, is a fitting memorial which has taken more than a year to complete, and will be decorated with various designs indicative of Pasteur's work and of the benefits he has conferred on humanity and the several industries.

DR. BEHRING, the discoverer of the anti-diphtheritic serum, has had the Grand Cordon of the Crown of Italy conferred upon him

THE German Emperor has conferred upon Dr. Roux, of the Pasteur Institute in Paris, the Royal Order of the Prussian Crown of the second class.

LADY PRESTWICH has given to the Geological Department of the British Museum the collection of fossils formed by her husband, the late Sir Joseph Prestwich.

IT is reported that Dr. Thorne-Thorne, chief medical officer of the Local Government Board, has arrived at Brussels, accompanied by a colleague, to study the vaccination system in Belgium and the laws and regulations bearing upon the subject.

THE death is announced of M. Alfred Nobel, whose name is well known in connection with the invention of dynamite and similar high explosives.

Globus (vol. lxix. No. 24) announces that the waters of Lake Titicaca continue to subside with astonishing rapidity. A large area of land has been exposed on the northern shore.

LIEUT. HOURST, whose explorations in the Niger region were referred to last week (p. 133), arrived in Paris on Sunday last. The *Times* correspondent says he was welcomed at the railway station by representatives of the Colonial Office, the French Africa Committee, the Egypt Committee, the Paris Geographical Society, and the Explorers' Society. He has made a splendid collection of sketches and photographs.

MR. J. E. S. MOORE, of the Royal College of Science, London, who has been investigating the African Lake Fauna, has this week notified his safe return to Zanzibar. In a letter, dated August 10, he reported himself about to start on his last dredging trip. He has made extensive zoological and geological collections; and in the correspondence which he has sent home, he announces, among other things, the discovery of an apparent dimorphism in the Tanganyika medusa, with active budding in both forms.

IT is reported that the bubonic plague shows no abatement at Bombay. So far, eight hundred deaths have been reported; but the actual number is believed to be much larger. The *British Medical Journal* has drawn attention to the serum prepared by Dr. Yersin at the Pasteur Institute in Saigon for the treatment of the plague; and the authorities in Bombay are urged to request Dr. Yersin to visit their city, and to afford him opportunities of practising his serum injections on the plague-stricken. The success claimed for the serum in Amoy, China, can be readily tested in Bombay.

REUTER reports that at Laurvik, on the southern coast of Norway, near the Swedish frontier, about nine o'clock on Monday morning, a wave of earthquake was perceived, taking the direction east to west. Several houses shook. At Karlstad in the province of Wermland, in Sweden, at 8.30 a.m. on Sunday, December 13, there occurred two very strong shocks of earthquake following each other in quick succession from south-east to north-west, and lasting about twenty seconds. Houses trembled, and furniture was thrown down. Seismic disturbances were also felt at other places in the province of Wermland. The shocks in this district were preceded by loud rumblings.

WE are gratified to know that the year 1896 has not been permitted to pass without the formation of a strong and representative Committee to promote a national memorial to Dr. Edward Jenner. At a meeting held at St. George's Hospital last week, Sir Joseph Lister occupying the chair, it was resolved, upon the proposition of the Bishop of Rochester: "That the present year being the centenary of the first successful vaccination is an appropriate time to inaugurate a work of national utility in honour of Edward Jenner." The resolution was seconded by Lord Reay, and supported by Sir Richard Quain and Dr. Michael Foster. Lord Glenesk moved the second resolution: "That a subscription be set on foot with the view of founding some institution of a nature to be hereafter determined in connection with the British Institute of Preventive Medicine to be distinguished by Jenner's name." Dr. Wilks, in supporting the resolution, said that every civilised country in the world had accepted this discovery. We alone had no great national monument. Prof. Burdon Sanderson, Mr. Jonathan Hutchinson, Dr. Bond and Dr. Glover also expressed their support, and the resolution was passed. Prof. Clifford Allbutt moved: "That a public meeting be called early in 1897 to consider the resolutions passed at this meeting, and to finally decide the form of the memorial." He urged that the memorial should involve means of carrying on research. The motion was seconded by Mr. Brudenell Carter, and agreed to. A Committee, containing not only the names of a number of distinguished men of science, but of other men of "light and leading," was nominated by the meeting; so we may confidently expect to see, at no very distant date, a worthy monument erected in recognition of Jenner's work and merit.

THE steamer *Wilkommen*, which arrived at New York from Dantzic a few days ago, is reported to have had a novel experience. On the morning of November 17, in lat. 48° 10′ N., long. 44° E., an immense meteor fell from south-east to north-west, and leaving a trail of light which remained visible for several minutes, entered the ocean apparently about two miles ahead of the steamer. Fifty minutes later a great wave swept over the steamer, but there is no evidence that this had any connection with the fall of the meteor.

THE preparation of a flora of Russia is being arranged, according to a *Daily News* correspondent, by the Imperial Natural History Society of St. Petersburg. An appeal is to be sent to all institutions and persons occupied with the study of botany to assist in the work. The flora of European Russia will be published first, and followed in time by those of Asiatic Russia and the Caucasus, the material being acquired from voluntary workers. It is hoped that the undertaking will meet with support and encouragement because of its great scientific importance.

PROF. G. VICENTINI and Prof. G. Pacher, writing in the *Atti e Memorie* of the Academy of Padua, describe several interesting results obtained with the current of a Tesla transformer, the most noteworthy effect being the production of shrill musical sounds with a disposition of the apparatus which the authors propose to call an "electrical syren." The phenomenon in question presents several peculiar features.

AN apparent proof of the inheritance of acquired characteristics was obtained two years ago by Mr. Leonard Hill, in experiments upon guinea-pigs, the results being briefly described by him in these columns (vol. 50, p. 617). From a note in the current number of the *British Medical Journal*, upon a recent discussion at the Zoological Society, it appears that further experiments has led Mr. Hill to a conclusion opposed to that provisionally expressed in his letter to us. According to our contemporary, Mr. Hill has been entirely unable to confirm the experiments by which Brown-Séquard determined the inheritance of acquired characteristics. By division of the cervical sympathetic nerve, a permanent droop of the upper eyelid can be obtained. This Brown-Séquard stated to be inherited by the young. Mr. Hill divided the nerve in six guinea-pigs on the left side, but none of the children inherited the permanent droop of the eyelid. He again divided the nerve in twelve of the children, and interbred them, but none of the young inherited the permanent droop. A temporary droop of either the right or left upper eyelid, frequently observed in the young, was caused by conjunctivitis arising from infection of the eye at birth, for the young were never born with the droop. With the conjunctivitis disappeared the droop, which was not due to paralysis, but to photophobia, and often disappeared on sudden excitation of the animals.

THE actual state of affairs as to the attempt to prevent free access to the Giant's Causeway was described at a recent meetting of the Belfast Naturalists' Field Club, by the President, Mr. Lavens W. Ewart, in the following words:—"A few speculators have banded themselves together to endeavour to exclude the public from free access to this truly gigantic creation, and they have invoked the Court of Chancery to establish them in this undertaking. Three gentlemen, of whom, unfortunately, I am one, have been served with writs in respect of so-called trespass, and the battle has begun. A committee had already been formed to protect the rights of the public, and they are defending the action. Owing to the fact that the Causeway Syndicate is a public company, they cannot be required to give security for costs, and as their capital consists of, I am informed, but 7*l.*, whether we win or lose, we—that is to say, the Causeway Defence Committee—will have to pay our own costs. Our solicitors estimate that the costs may amount to 400*l.*, and this sum at least we must raise. We ask for help in the matter of collecting subscriptions, and collecting lists will be supplied to all who will take them. Large subscriptions, as a rule, are not asked for, but small sums given by the many, for it is a matter which concerns the many. Evidence is also wanted from those who have known of the Causeway as a public resort for forty or fifty years or more."

THE Anthropological Institute of Great Britain and Ireland has successfully promoted the study of the science of man ever since it was founded; and the twenty-five volumes of the *Journal*, now complete, contain abundant evidence of the extent to which the Institute has contributed to the progress of anthropology in the last quarter of a century. The Council are anxious, however, to obtain a greater measure of public support, to see a larger attendance of Fellows and their friends at the meetings, to increase the number of papers printed in the *Journal*, and to illustrate them more fully, and to aid in many other ways in the progress of anthropological research. "In most continental countries," rightly remarks the President, Mr. E. W. Brabrook, "the means of doing this would be found in a subsidy from the State, and few appropriations of public money would be more worthy or more likely to prove reproductive, in benefit to the community at large, than a payment in aid of anthropological work. In this country, however, it is the practice to leave work of this kind to those who show a voluntary interest in it by joining the Institute as Fellows." It is hoped, therefore, that the number of Fellows will be largely increased, so as to increase the usefulness of the Institute, and assist still more actively the progress of anthropological science.

We have been glancing through a new list of the staffs of the Royal Gardens, Kew, and of botanical departments and establishments at home, and in India and the Colonies, in correspondence with Kew. If evidence of the influence of Kew upon the advancement of botanical science is ever needed it will be found in this list, published as Appendix III. to the *Bulletin of Miscellaneous Information*. Nearly seventy members of the staffs of botanic gardens in diverse regions of the world are marked as having been trained at Kew. No establishment that we know of can present a better record of work accomplished, and none could desire a worthier testimonial of efficiency than that shown by the wide distribution of Kew men. For the information of directors, superintendents, and curators in botanic gardens across the seas, we announce that a list has just been published of seeds of hardy herbaceous annual and perennial plants and of hardy trees and shrubs which, for the most part, have ripened at Kew during the year 1896. These seeds are not sold to the general public, but are available for exchange with colonial, Indian, and foreign botanic gardens, as well as with regular correspondents of Kew. No application, except from remote colonial possessions, can be entertained after the end of March. The list is published in the *Bulletin* for 1897, Appendix I., an advance copy of which has been sent us.

During the last fifty years much work has been done by marine naturalists all round the British coasts, with a view to determining the distribution of those animals which live on the floor of the sea. It has been fully recognised that the localities frequented by many marine species are very definite and extremely limited in extent, and that both the nature of the sea-bottom and the creatures which live there exhibit as much variety as we are accustomed to find on land. The Marine Biological Association, with the assistance of a grant made for the purpose by the Royal Society, has recently been engaged in an attempt to place our knowledge of this subject upon a sounder basis by investigating in detail some of the grounds in the neighbourhood of Plymouth, including important fishing grounds, with reference to the nature of the sea-bottom at each locality, and the whole assemblage of animals found there. Detailed charts are being prepared to exhibit the variations which take place from point to point. No attempt has previously been made to study fishing grounds with such thoroughness, having regard not only to the fishes, but to the whole collection of animal life which forms the basis of the food upon which the fishes exist. The investigation, which has involved a large amount of dredging and trawling, as well as the identification of the numerous species captured, has been carried out by Mr. E. J. Allen, the Director of the Plymouth Laboratory.

The principles upon which long-period weather forecasts are made in India were described in a recent number of Nature (November 26, p. 87). In connection with this subject it is interesting to note that the official forecast of the cold-weather rains in Northern and Upper India has just been published. According to the Calcutta correspondent of the *Times*, the conclusions drawn are that the winter rains in Upper India (from December to February) will very probably be at least normal, and that they may be in moderate excess. It is probable that the winter precipitation in the Gangetic plain will be about normal, and very probable that it will not be above normal. It is very probable that the rainfall of the next four months will be slightly defective in Assam and perhaps in Bengal. It is, on the whole, very probable that the rainfall in Central India and the Central Provinces will not be above the small normal of the period, and may be below it. The general inference is that the indications are to some extent conflicting, but that, on the whole, they are favourable in North-western India. The rainfall will hence be normal, or above it, in Upper India, and probably normal, or in slight to moderate deficiency, in North-eastern and Central India.

The jubilee of the foundation of the Hakluyt Society was celebrated by a special meeting on Tuesday. During the fifty years the Society has been in existence it has issued numerous volumes containing the texts of travellers and voyagers in all parts of the world, which were previously unedited, untranslated, or unknown. By this action, remarked Sir Clements Markham, in his address to Tuesday's meeting, the Society has continued the work and strove to fulfil the aspirations of Richard Hakluyt. This great man, like the Society which bears his honoured name, is not so well known to the present generation, which owes so much to his labours, as he ought to be. Hakluyt saw the two great needs of his country. The first was caused by the ignorance of our seamen as regards the scientific branch of their profession. The second was the absence of records, and the way in which important voyages and travels were allowed to fall into oblivion. He strove, during a long life, with great ability and untiring perseverance, to remedy these evils; and the measure of success he attained justly placed his name among those of worthies who deserve well of their country. The great work of Hakluyt was the "Principal Navigations," in three folio volumes, a monument of useful labour. Shakespeare owed much to this work: Milton owed much more. Hakluyt died on November 23, 1616, in his sixty-fourth year.

The U.S. Commission of Fish and Fisheries has just distributed a report, by Mr. B. W. Evermann, upon salmon investigations in the headwaters of the Columbia River, in the State of Idaho, in 1895, together with notes upon the fishes observed in that State in 1894 and 1895. The observations refer chiefly to the spawning habits of the redfish (*Oncorhynchus nerka*) and the Chinook salmon (*O. tschawytscha*). The proof that the large form of redfish is anadromous—that is, passes from the sea into fresh waters at certain seasons—appears to be conclusive, but the evidence that the small redfish comes up from the sea is not complete. It seems probable that both forms are anadromous; but, so far as the Idaho lakes are concerned, the small form has not been proved to be so. The redfish all die soon after spawning, while the young remain in the lakes and connecting waters for at least one year from the time when the eggs were spawned. The Chinook salmon also die soon after spawning; and the young appear to remain, for one year after the eggs are laid, near where they were hatched.

The current number of the *Journal de Physique* contains a paper, by M. C. Duperray, on the optical properties of a glass cylinder in rapid rotation in a magnetic field. The experiments were undertaken to test the accuracy of Villari's result, that it requires quite an appreciable time (1/800 second) for a piece o flint glass to acquire the property of rotating the plane of polarised light when subjected to a magnetic field. Villari came to this conclusion, which is in direct contradiction to the results obtained by Bichat and Blondlot, and Curie by rotating a glass cylinder between the poles of a magnet, with the axis of rotation perpendicular to the lines of force. If a beam of polarised light traversed the cylinder in the direction of the lines of force, Villari found that the rotation of the plane of polarisation decreased as the velocity of rotation of the cylinder increased, so as to become zero for a velocity of about 200 turns per second. He explained this result as being due to the molecules of the glass requiring a finite time to acquire the power of rotating the plane of polarised light. The author, in order to test the accuracy of Villari's deduction, has examined the optical properties of the rotating glass cylinder, and he finds the following:—The effect of centrifugal force on the glass is to virtually constitute it a bi-refringent body, with its axis parallel to the axis of rotation. Hence, unless the plane of polarisation of the incident light is parallel or perpendicular to the axis of rotation, the emergent light is elliptically polarised. The author, making use of this discovery, then arranged the plane of polarisation either parallel or perpendicular to the axis of rotation, and found that in a magnetic field of such a strength that the rotation was about 5°, so that the plane of polarisation of the emergent light remained practically either parallel or perpendicular to the axis of rotation, no change in the rotation produced by the magnetic field was produced by rotating the cylinder even at velocities exceeding 200 turns per second. Hence he concludes that the bi-refringence induced by the rotation may have vitiated Villari's results.

In *Science* of May 1, 1896, Prof. Bigelow says:—"A scientific knowledge of the action of the currents in cyclones and anti-cyclones can be obtained only by a determined attack upon the physics of the upper levels of the atmosphere." Following out this idea, and owing to the impetus given to the systematic study of the clouds by the action of the Meteorological Conference at Munich in 1891, Mr. H. B. Boyer, the Weather Bureau observer at Key West, Florida, has published a pamphlet entitled "Atmospheric Circulation in Tropical Cyclones, as shown by the Movement of the Clouds." The observations were begun in 1891, and in the treatment of the data each storm is taken in its chronological order, while the different currents and the bearing of the centre are shown on diagrams. The conclusions as to the behaviour of the upper and lower clouds in tropical storms are, so far as they go, valuable, and agree, upon the whole, with those found to obtain in our latitudes.

Spelunca continues to publish accounts of cave exploration in various parts of the world. No. 7–8 of vol. ii. contains some good views of cliffs and caves in the Liparis, along with other interesting matter.

Two publications of the Geological Survey of Alabama have come to hand. One is a very detailed description of the iron industry of that State; the other (*Bulletin* No. 5) is a preliminary report on the mineral resources of the Upper Gold Belt, with petrographical descriptions of the crystalline rocks.

Physical investigators and instrument makers will be interested to know that Prof. C. V. Boys contributes to the *Electrician* of December 11, the first part of a detailed description of the method of making and manipulating the fine quartz fibres for which his name is famous.

The Belfast Naturalists' Field Club has issued, as an appendix to its *Proceedings*, a "Bibliography of Irish Glacial and Post-Glacial Geology," by R. Ll. Praeger. This contains a list of over 700 books and papers, varying in importance from a geological survey memoir to an anonymous letter to a local newspaper. A subject-index and a geographical index are added. It should prove of great value both to Irish and to "glacial" geologists; while in the thoroughness with which it has been compiled, and the method of cataloguing, it may serve as a model to all local bibliographers.

A detailed discussion of the meteorological conditions at Frankfurt a.M., from observations extending over thirty-six years (1857–92), has been completed by Dr. Julius Ziegler and Prof. Dr. Walter König, and is now published under the title "Das Klima von Frankfurt am Main" (C. Naumann). The observations, which were made under the auspices of the Physikalische Verein, have been subjected to a very careful analysis, and the results are expressed diagrammatically upon ten full-page plates and several figures in the text.

Three local scientific societies have lately sent us reports comprising papers read at their meetings. In the *Transactions* of the Edinburgh Field Naturalists' and Microscropical Society (1894–96), we notice papers on Daubenton's Bat (*Vespertilio Daubentoni*), as observed and captured in Glen Dochart, Perthshire, the geology of Arran, trout and their influence in purifying water, the little Auk, poisonous plants, the habits of Gulls, popular delusions in natural history, and researches on snake poison, with special reference to the work of Dr. Cunningham, of Calcutta.—The *Transactions* of the Ealing Natural Science and Microscopical Society (1895–96) contain a descriptive list of the birds of the Lower Brent Valley, and abstracts of lectures on parasitic and saprophytic plants, the last stages of the Great Ice Age in the neighbourhood of Ealing, and the relation of man thereto, recent astronomical photography, the life-history of *Atypus piceus*, wild bees, the structure of flames, and others.—The portrait of Prof. Ramsay forms the frontispiece of the *Proceedings* of the Bristol Naturalists' Society, and is accompanied by a short biographical notice. Among the papers is one on the British Jurassic Brachiopoda, and another on some ancient British remains at Long Aston, Somerset.

Limits of space prevent us from doing more than refer to a few of the papers in the *Journal* and *Proceedings* of the Royal Society of New South Wales (vol. xxix.), received a few days ago. In an important paper Mr. Lawrence Hargrave describes his aeronautical experiments with cellular kites. Mr. G. H. Knibbs contributes a long account of the history, theory, and determination of the viscosity of water by the efflux method; and Dr. C. J. Martin gives the results of a detailed investigation of the physiological action of the venom of the Australian Black Snake (*Pseudechis porphyriacus*). The surviving refugees, in austral lands, of ancient antarctic life are considered by Mr. C. Hedley. The paper by Mr. H. C. Russell, on icebergs in the Southern Ocean, and that of Mr. Henry A. Hunt, on types of Australian weather, have already been noted in these columns. In a paper on the amount of gold in sea-water, Prof. Liversidge concludes that gold is present in the sea-water off the coast of New South Wales in the proportion of about ·5 to 1 grain per ton, or, in round numbers, from 130 to 260 tons of gold per cubic mile. The results, in a second paper on the removal of silver and gold from sea-water by Muntz metal sheathing, indicate that by keeping the metal in the sea for several years the proportion of gold increases, while that of silver decreases. Ethnologists will be interested in Dr. John Fraser's presentation of three myths about the Senga parroquet, showing how intimately Fiji and Samoa were connected in the minds of the early myth-makers. The subjects of other contributions to the volume are Australian vegetable exudations; notes on Antarctic rocks, collected by Mr. C. E. Borchgrevink; the great meteor of May 7, 1895; and fascine work in New South Wales.

The additions to the Zoological Society's Gardens during the past week include a Grey Ichneumon (*Herpestes griseus*) from India, presented by Colonel Smythe; a Changeable Tree Frog (*Hyla versicolor*) from North America, two White's Tree Frogs (*Hyla cœrulea*) from Australia, presented by Mr. F. E. Blaaw; two Maned Geese (*Chenonetta jubata*) from Australia, purchased.